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APPARATUS FOR THE STUDY OF BACTERIAL
AND VIRUS AEROSOLS

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V. P. Zhalko-Titarenko

Currently known apparatuses for the study of bacterial and virus aerosols do not guarantee that the aerosol structure will be constant as the specimen is taken, do not permit more than 3-4 samplings (which necessitate multiple repetitions of the experiment in order to obtain a complete graphic function in the study), are applicable to only one form of study and are not sufficiently safe in operation.

The apparatus proposed for study of bacterial and virus aerosols is free from these drawbacks.

The apparatus ensures that the aerosol structure will be constant as the specimen is taken, allows multiple samplings without a change in the aerosol structure, is universal and safe in operation.

The higher operational indices in this apparatus as compared with those currently known are achieved by dividing its variable capacity chamber into two parts connected by rubber bellows, which permit the suitable decrease in volume, and by a device for creating an artificial climate.

Figure 1 is the front view of the apparatus, and figure 2 is the plan view.

The apparatus consists of a variable capacity chamber 1 with sprayer 2, which create the models of the aerosols, and is equipped with cocks placed at various levels in the chamber and used to take samples of contaminated air; it also is equipped with compartments 3 placed in the upper part of the chamber for animals.

A short flexible piece connects the inside compartment of the chamber from below with an ultramicroscopic instrument, which is the particle counter.

A network of conduits is concentrated in housing 4 of the apparatus, and used to control and regulate the operation of the chamber. An air thermosterilizer is built into the housing from the back side of the wall. The electrical equipment in the apparatus is controlled by a group of switches 5 and signal lamp 6.

The power unit of the apparatus consists of a vacuum pump and compressor, which feed the artificial climate system and sprayer with compressed air.

Variable capacity chamber 1 is made in two parts: upper 7 and lower 8, hung from the upper by pulleys 9, 10 and counter-weight 11. Both chambers are connected in the middle by rubber bellows 12, which achieves the suitable decrease in internal volume of the chamber while lifting the lower part.

The scale of sliding bracket 13 is marked with the exactly measured amounts of the volume decrease in chamber 1.

Before the air is evacuated, bracket 13 is placed at the amount of the assumed sample and during the evacuation does not permit the lower part of the chamber to rise above the limit corresponding to the volume of evacuated air. This makes the pressure remain at the same level as before the sampling.

The dimension of the probe is determined according to the indices of a general-type water-measuring instrument.

The artificial climate device sets up a specific moisture level in the chamber using a high-pressure line and maintains a preassigned temperature condition by means of a heating element located on the bottom of the lower part of the chamber. Minus temperatures are achieved by a freon cooling system.

Object of the Invention

An apparatus of the study of bacterial and virus aerosols put together as a chamber with sprayer, cocks for taking samples and compartments for animals differ in that a constant aerosol structure is guaranteed while the samples are taken by means of dividing the chamber into two parts connected by rubber bellows which permits a suitable decrease in the volume, and also by a device for the creation of an artificial climate.

Figure 1

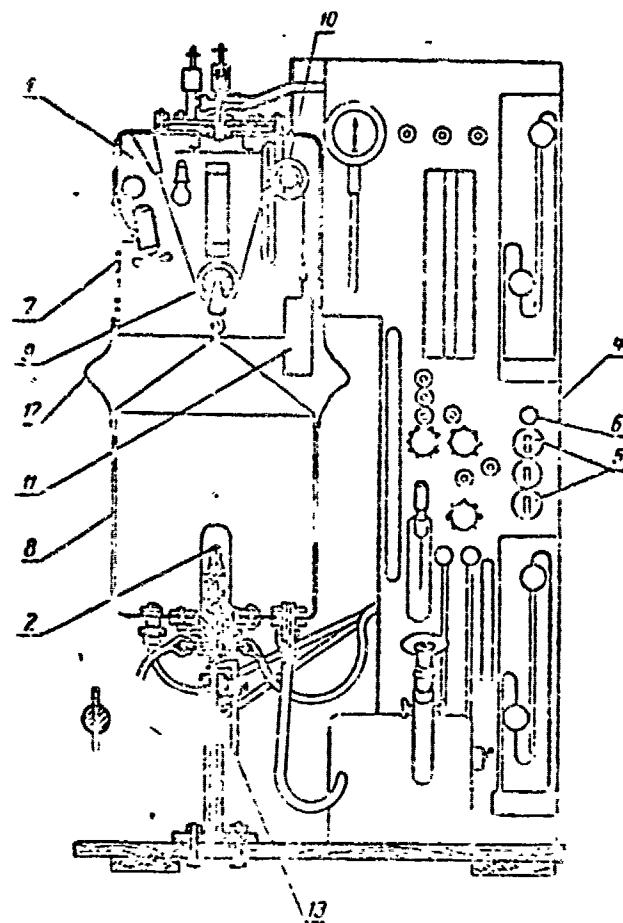


Figure 2

